CLAIMS

What is claimed is:

1. A fuel cell system comprising:

a plurality of fuel cell stacks connected in parallel and supplying a gross current to a load;

a plurality of inputs to and a plurality of outputs from said stacks; and

a controller that produces a desired current through said load by adjusting, based on said gross load current, at least one parameter affecting at least one of said inputs and outputs.

2. The fuel cell system of claim 1 wherein said controller adjusts at least one of an anode input, an anode output, a cathode input and a cathode output.

3. The fuel cell system of claim 1 wherein the at least one parameter comprises one of pressure, humidity, stoichiometry, nitrogen dilution and temperature.

4. The fuel cell system of claim 1 wherein said stacks include equal pluralities of cells.

5. The fuel cell system of claim 1 wherein said controller produces a desired current through said load by producing a desired current through one of said stacks.

6. The fuel cell system of claim 1 wherein said controller controls a first current through a first of said stacks and a second current through a second of said stacks, the second current controlled independently of the first current.

7. The fuel cell system of claim 6 wherein said controller controls the first and second currents based on set points proportional to active areas of said first and second stacks.

8. The fuel cell system of claim 1 further comprising a contactor connected between one of said stacks and the load.

9. The fuel cell system of claim 1 further comprising a current sensor that senses a current generated by one or more of said stacks;

wherein said controller uses said sensed current to determine said gross load current.

10. The fuel cell system of claim 1 wherein said controller uses said gross load current to determine a gross cathode stream mass flow rate.

11. The fuel cell system of claim 1 further comprising a pair of oxygen sensors that sense oxygen consumption by one or more of said stacks;

wherein said controller uses said sensed oxygen consumption to determine said gross load current.

12. The fuel cell system of claim 1 wherein a total power is adjusted by adjusting the plurality of parallel stacks.

13. A fuel cell system comprising:

a plurality of fuel cell stacks electrically connected in parallel to supply a load, each stack comprising a plurality of inputs and outputs affected by a plurality of parameters; and

a controller that determines a current from one of said stacks to the load, and, based on said determined current, adjusts at least one of said parameters to produce a desired current through the load.

14. The fuel cell system of claim 13 wherein said controller produces a desired current from at least one of said stacks to the load.

15. The fuel cell system of claim 13 wherein the at least one of said parameters comprises one of pressure, humidity, stoichiometry, nitrogen dilution and temperature.

16. The fuel cell system of claim 13 wherein said controller adjusts at least one of an anode input, an anode output, a cathode input and a cathode output.

17. The fuel cell system of claim 13 wherein said controller determines a gross load current using the determined current, and balances said inputs based on the gross load current.

18. The fuel cell system of claim 13 wherein said controller determines a gross load current using the determined current, and balances a plurality of stack currents based on the gross load current.

19. A method for controlling power to a load supplied by a plurality of fuel cells, comprising:

combining the fuel cells to provide a plurality of fuel cell stacks;

connecting the stacks in parallel; and

controlling at least one of an input to and an output from a given stack to provide a desired current through the given stack.

20. The method of claim 19 further comprising using the desired current through the given stack to provide a desired current to the load.

21. The method of claim 19 further comprising combining the fuel cells to provide stacks having equal pluralities of cells.

22. The method of claim 19 wherein controlling at least one of an input to and an output from a given stack comprises controlling at least one of pressure, humidity, stoichiometry, nitrogen dilution and temperature.

23. The method of claim 19 wherein controlling at least one of an input to and an output from a given stack comprises controlling at least one of an anode input and a cathode input.

24. The method of claim 19 wherein controlling at least one of an input to and an output from a given stack comprises:

determining a stack load current through at least one of the stacks; and determining the desired current through the given stack using the determined stack load current.

25. The method of claim 19 wherein controlling at least one of an input to and an output from a given stack comprises:

determining oxygen consumption across the given stack; and

determining the desired current through the given stack using said determined oxygen consumption.

26. The method of claim 25 wherein said determining oxygen consumption comprises determining oxygen concentrations in a cathode inlet and outlet.

27. The method of claim 19 wherein controlling at least one of an input to and an output from a given stack comprises:

determining a gross load current; and

using said gross load current to determine a gross cathode stream mass flow rate.

28. The method of claim 19 further comprising controlling at least one input to a given stack to eliminate a current through the given stack.

29. The method of claim 19 further comprising controlling at least one input to a plurality of said stacks to control a plurality of currents through said plurality of stacks.

30. The method of claim 19 further comprising changing the plurality of parallel stacks to change power to the load.

31. A method for controlling power to a load supplied by a plurality of fuel cells, comprising:

combining the fuel cells to provide a plurality of fuel cell stacks, each of said stacks having a standard number of cells;

electrically connecting said stacks in parallel to provide a standard voltage range across each of said stacks; and

controlling at least one of a plurality of parameters affecting at least one of an input to and an output from at least one said stack to control current produced by said stack.

32. The method of claim 31 further comprising controlling at least one of said parameters to obtain a desired set-point for current from one of said stacks.

33. The method of claim 32 further comprising:

determining a gross current to the load; and

balancing currents from the stacks based on said gross load current.

34. The method of claim 32 wherein the desired set point for current from one of the stacks is proportional to an active area of the one of the stacks.

35. A method for controlling power to a load supplied by a plurality of fuel cells, comprising:

combining the fuel cells to provide a plurality of fuel cell stacks;

electrically connecting said stacks in parallel;

determining a gross current to the load; and

balancing currents produced by said stacks based on said gross load current to provide a desired load current,

said balancing performed using at least one of an input to and an output from at least one of said stacks.

36. The method of claim 35 further comprising determining an oxygen consumption level in a stack to determine a current level across the stack.

37. The method of claim 36 wherein determining an oxygen consumption level comprises comparing oxygen concentrations in a cathode inlet and outlet.

38. The method of claim 35 wherein balancing currents produced by said stacks comprises determining a current through a stack to the load.

39. The method of claim 38 wherein said determining a current is performed using one of a current sensor and an oxygen sensor.